Exponential Distribution (3)

- Memoryless/Markov property
  - The future is independent of the past!
  - The remaining lifetime of a component, which functions at time t, is independent of t

$$R(h \mid t) = P\{T > t + h \mid T > t\}$$
$$= P\{T > h\} = R(h) \quad \forall t, h > 0$$

$$P\{T > t + h \mid T > t\}$$
$$= \frac{P\{T > t + h \bigcap T > t\}}{P\{T > t\}}$$
$$= \frac{P\{T > t + h\}}{P\{T > t\}} = \frac{e^{-\lambda(t+h)}}{e^{-\lambda t}}$$
$$= e^{-\lambda h} = P\{T > h\}$$